S
632.95
H3po
1988

Symons, Roy
Pesticide
operator

PESTICIDE OPERATOR

STATE DOCUMENTS COLLECTION

[illegible]

MONTANA STATE LIBRARY
1515 E. 6th AVE.
HELENA, MONTANA 59620

MONTANA

DEPARTMENT of HIGHWAYS

PLEASE RETURN

MONTANA STATE LIBRARY
S 632.95 H3po 1988 c.1 Symons
Pesticide operator.
3 0864 00061989 3

EMERGENCY SUPPLIES

___/ Rubber or Neoprene Gloves (2 pairs)

___/ Rubber or Neoprene Overshoes (1 pair)

___/ Absorbent Material (1 large bag)
Fullers Earth, Kitty Litter, etc.

___/ Detergent (10 lbs or 2 qts.)
Tide, All Cheer, etc.

___/ Disposable 5 Gallon Pail
Water tight with a sealable lid

___/ Heavy-duty Disposable Plastic Garbage Bags

___/ Natural Bristle Broom

___/ Scoop Shovel

___/ Round Point Shovel

___/ Fire Extinguisher (10 lbs.)
Rated for A, B, and C fires

___/ First Aid Kit

___/ Syrup of Ipecac

___/ Baking Soda (1 lb.)

___/ Oral Thermometer

___/ Table Salt

___/ Fresh Water

RS:2:ts:24e/45

PESTICIDE OPERATOR

MONTANA DEPARTMENT OF HIGHWAYS

MAINTENANCE AND EQUIPMENT DIVISION

FOR HAZARDOUS MATERIAL EMERGENCIES
CALL MONTANA DISASTER & EMERGENCY SERVICES—DAY OR NIGHT
(AREA CODE 406) 444-6911

MONTANA POISON CONTROL SYSTEM
1-800-525-5042

March 1988
Roy Symons
Training Officer

RS:2:ts:24e/1

PURPOSE

This booklet is compiled as a ready reference for pesticide operators. The size is intended to make it convenient to carry to the field. Although compiled from several sources, it is not intended to replace more in-depth information available from the Montana Department of Agriculture manuals or chemical and equipment manufacturers. For specifics, the operator should always read the labels on chemicals and manufacturers' operation manuals for equipment. This booklet and accompanying instructions are intended to meet immediate needs for field operations.

TABLE OF CONTENTS

CALIBRATING BOOM SPRAYERS 1
CHANGING APPLICATION RATE 5
CALIBRATING HAND SPRAYERS 7
RECORD KEEPING AND HANDLING COMPLAINTS 10
PESTICIDE REGULATIONS AND GUIDELINES 14
TOXICITY OF HERBICIDES 28

FIRST AID

I - Poisoning 32
    A. Conscious Victim 34
    B. Unconscious Victim 34
    C. Victim in Convulsions 35
II - Chemical Burns 37

III - Chemical Burns to the Eyes

    A. Acid Burns 38
    B. Irritating Gases 39

IV - Heat

    A. Heat Cramps 39
    B. Heat Exhaustion 40

Digitized by the Internet Archive
in 2016

https://archive.org/details/pesticideoperato1988symo

CALIBRATING BOOM SPRAYERS

To apply chemicals in a water solution, at a recommended rate, you need to know how much water the sprayer delivers. Application rates vary with nozzle size, tank pressure, and speed of travel. Sprayers are usually calibrated on a small area. The volume discharged is calculated on a gallon-per-acre basis.

Method Number 1

1. Measure and stake 330 feet (20 rods) in a straight line.

2. Fasten a container to catch the spray from each of the nozzles. (Individual nozzle output should not vary more than 10 percent from the average.)

3. Fill the sprayer with water and spray the test section using the same pressure and speed used for normal spraying.

4. Measure and record the water collected from each nozzle separately. Calculate

the average nozzle application rate. Calculate the 10 percent margin to identify nozzles to be replaced.

Example (1)

Step I

Nozzle (1) 30 oz.
(2) 28 oz.
(3) 34 oz.
(4) 24 oz.
(5) 31 oz.
(6) 32 oz.
179 total

Step II

179 ÷ 6 = 29.8 average
or 30 oz.

Step III

30.0
x.10
3.00 or 3 oz.

Step IV

30+3=33
30-3=27 var. margins

Step V

Nozzle 3 applying 34 ounces and 4 applying 24 ounces are beyond the margins and should be replaced.

5. Use the chart on the next page to determine the amount of water in gallons per acre (GPA) being delivered.

AMOUNT OF WATER (IN GALLONS PER ACRE) BEING DELIVERED

If the Average Ounces of water is:	And if the distance between nozzles, or band width, in inches is:						
	7"	8"	12"	14"	16"	18"	20"
2	3.5	3.1	2.1	1.8	1.5	1.4	1.2
3	5.3	4.6	3.1	2.7	2.3	2.0	1.8
4	7.1	6.2	4.1	3.5	3.1	2.7	2.5
5	8.8	7.7	5.1	4.4	3.8	3.4	3.1
6	10.6	9.2	6.2	5.3	4.6	4.1	3.7
7	12.3	10.8	7.2	6.2	5.4	4.8	4.3
8	14.1	12.4	8.2	7.1	6.2	5.5	4.9
9	15.9	13.9	9.4	7.9	6.9	6.2	5.5
10	17.7	15.4	10.8	8.8	7.7	6.9	6.2
11	19.4	17.0	11.6	9.7	8.5	7.5	6.8
12	21.2	18.6	12.4	10.6	9.3	8.2	7.4
13	22.9	20.1	13.4	11.5	10.5	8.9	8.0
14	24.7	21.7	14.4	12.4	10.8	9.6	8.7
15	26.4	23.3	15.4	13.2	11.6	10.3	9.3
16	28.2	24.8	16.5	14.1	12.4	11.0	9.9
17	30.0	26.3	17.5	15.0	13.1	11.7	10.5
18	31.8	27.8	18.6	15.9	13.9	12.4	11.1
19	33.5	28.9	19.6	16.8	14.7	13.0	11.7
20	35.3	30.1	20.6	17.7	15.5	13.7	12.4
21	37.1	32.0	21.6	18.5	16.2	14.4	13.0
22	38.9	34.0	22.7	19.4	17.0	15.1	13.6
23	40.6	35.6	23.7	20.3	17.8	15.8	14.2
24	42.4	37.1	24.7	21.2	18.6	16.5	14.8
25	44.2	38.6	25.7	22.1	19.3	17.2	15.4
26	46.0	40.2	26.8	23.0	20.0	17.9	16.1
27	47.7	41.7	27.8	23.8	20.8	18.5	16.7
28	49.5	43.3	28.9	24.7	21.7	19.2	17.3
29	51.2	44.8	29.9	25.6	22.4	19.9	17.9
30	53.0	46.4	30.9	26.5	23.2	20.6	18.5
31	54.8	47.9	31.9	27.4	24.0	21.3	19.1
32	56.6	49.5	33.0	28.3	24.8	22.0	19.8
33	58.3	51.0	34.0	29.1	25.5	22.7	20.4
34	60.0	52.6	35.0	30.0	26.3	23.4	21.0
35	61.8	54.1	36.0	30.9	27.0	24.1	21.6
36	63.6	55.7	37.1	31.8	27.8	24.8	22.3
38	67.1	58.8	39.1	33.6	29.3	26.1	23.5
40	70.7	61.9	41.2	35.4	30.9	27.5	24.8
42	74.3	65.0	43.3	37.1	32.4	28.9	26.0
44	77.8	68.1	45.4	38.9	34.0	30.3	27.2
46	81.3	71.2	47.4	40.6	35.5	31.6	28.4
48	84.9	74.3	49.5	42.4	37.1	33.0	29.7
50	88.4	77.4	51.5	44.2	38.6	34.4	30.9
52	91.9	80.4	53.6	46.0	40.2	35.8	32.2
54	95.4	83.5	55.6	47.7	41.7	37.1	33.4
56	99.0	86.6	57.7	49.5	43.3	38.5	34.7
58	102.5	89.7	59.8	51.2	44.8	39.9	35.9
60	106.0	92.8	61.9	53.0	46.4	41.3	37.1
62			63.9	54.8	47.9	42.6	38.3
64			66.0	56.6	49.5	44.0	39.6
66			68.1	58.3	51.0	45.4	40.8
68			70.1	60.1	52.6	46.8	42.1
70			72.1	61.8	54.1	48.1	43.3
72			74.2	63.6	55.7	49.5	44.6
74			76.3	65.4	57.2	50.9	45.8
76			78.4	67.2	58.8	52.3	47.0
78			80.4	68.9	60.3	53.6	48.2
80			82.5	70.7	61.9	55.0	49.5
82			84.5	72.5	63.4	56.4	50.7
84			86.6	74.3	65.0	57.8	52.0
86			87.6	76.1	66.5	59.1	53.2
88			88.6	77.9	68.1	60.5	54.5
90			89.6	79.6	70.0	61.8	55.7
92			90.7	81.4	72.0	63.2	56.9
94			94.8	83.1	73.1	64.6	56.1
96			99.0	84.9	74.3	66.0	59.4
98			101.0	86.6	75.8	67.4	60.6
100			103.1	88.4	77.4	68.8	61.9

RS:2:ts:24v

Example (2)

Nozzle 1: 30 oz., Nozzle 2: 28 oz.,
20" nozzle spacing

$$\begin{array}{r} 30 \\ +\ 28 \\ \hline 58 \end{array} \qquad 58 \div 2 = 29$$

From the chart read 17.9 GPA

Method Number 2

1. Measure and stake 660 feet in a straight line.

2. Fasten a container to catch the spray from each of the nozzles. (Individual nozzle output should not varv more than 10 percent from the average.)

3. Fill the sprayer with water and spray the test section using the same pressure and speed used for normal spraying.

4. Measure and record the water collected from each nozzle separately. Calculate the average nozzle application rate.

Calculate the 10 percent margin to identify nozzles to be replaced.

(See Example 1 - Method 1)

5. This method of calculation requires:

   a. The total amount of materials sprayed in the test section, to the nearest 1/4 gallon.

   b. The length of the boom.

Multiply the gallons by 66 and divide by the boom length.

Example: If 2.5 gallons of liquid is delivered by a 16.5 foot boom:

Step 1

2.5×66

Step 2

$$\frac{2.5 \times 66}{16.5} = 10 \text{ GPA}$$

CHANGING APPLICATION RATE

If your application rate is unacceptable, how do you change it? You can make three kinds of changes.

Nozzle Size can be changed to alter the application rate. Use larger tips to increase the rate. The main advantage of this method is that using the proper pressure helps to control drift and maintain the nozzle pattern. This is usually the preferred method of changing application rates.

Speed changes alter application rate. This method is practical for small changes in application rate. High speeds should be avoided because of drift problems and for safety reasons. Low speeds increase the time needed to spray a given area. This increases labor and equipment costs.

Pressure influences flow rate. Lower the pressure and you lower the flow rate. Raise pressure and flow rate is increased. However, this is not a good method to use for other than minor adjustments. You must increase pressure by a factor of 4 to double the flow. High pressure increases the number of small spray particles which can cause drift problems. Pressure too high or too low also distorts nozzle distribution patterns.

CHANGING APPLICATION RATES

(gallons/acre)

Change	Increase Application	Reduce Application
Pressure	Increase pressure	Reduce pressure
Nozzles	Use larger orifices, more nozzles	Use smaller orifices, fewer nozzles
Speed	Reduce speed	Increase speed

CALIBRATING HAND SPRAYERS

In calibrating hand spray equipment you actually calibrate individual people. The equipment will spray at the same rate. People, on the other hand, don't. Each individual will have a natural pace, some faster, some slower. You will have to know what each member of the crew's natural pace is. The following method will calculate a person's application rate. Adjustments need to be made to stay within the 10 percent margin of the intended application rate.

1. Measure and stake a square 18'6" x 18'6" (this is 1/128th of an acre and there are 128 ounces in a gallon).

2. Have each person spray the test section and time them.

3. Then spray into a container the same amount of time.

4. Measure the output in ounces. The number of ounces measured is a direct conversion to gallons-per-acre.

Operator 1

Operator 1 sprayed the test section in 35 seconds.

A 35-second spray put 105 ounces in the container. That converts to 105 gallons per acre.

Operator 2

Operator 2 sprayed the test section in 52 seconds.

A 52-second spray put 156 ounces in the container. That converts to 156 gallons per acre.

Both of these operators will usually work at approximately those natural rates. If the application rate for the chemical should be 100 gallons dilute solution per acre, the first operator is okay. Operator 2 is applying 50 percent more chemical than necessary. With a $70 an ounce chemical applied at 3 ounces per acre, that operator is wasting 1½ ounces or $105 worth of chemical per acre. Application at this stronger proportion will also change the result of the application. You could wind up sterilizing when the intent was to kill a certain target species.

Each hand spray operator's application rate should be calibrated. You can't recalibrate the operator so you have to make the equipment put out material at a rate to match the operator's pace. The first operator was within the 10 percent margin. The second operator is not within the acceptable margin. The most practical adjustment would be to change nozzle size, to reduce the output. Additional pressure changes can be used to make small adjustments. Each operator may need to have their own nozzles.

RECORD KEEPING AND HANDLING COMPLAINTS

Herbicides are very touchy topics with many people. Being a government agency also puts you in the spotlight. There will be complaints. Your best defense is proper, careful application and complete, accurate record keeping.

Good records require lots of specific information and observations of unusual events. Daily records should have information on:

- The name of the applicator and all operators

- Time of day; from - to
- Location as exactly as possible - route, milepost, county, local landmark, reference points (note gaps that aren't covered)
- Type of equipment
- Product
  Application rate
  Area treated
  Target species
- Weather conditions
  Wind speed and direction
  Temperature
  (Even with consistent wind direction, a curve in the roadway will shift the area of concern for drift problems)

Application data should be recorded daily. By Friday it may be hard to remember details about Tuesday. Unless you are in a continuous spraying operation, entries may even be needed during the day. When there are breaks in the spray coverage, weather changes, or any unusual incidents, this should be recorded. Separate areas sprayed by hand from boom sprayed areas in your records. Record calibration data when you calculate it.

Good records are your best tool in handling complaints. Quick response to complaints also helps quiet a volatile situation. When you get a complaint, listen, take notes, and ask leading questions. Understand the problem before reacting. Don't become defensive. Understand the details completely but don't stonewall either. These problems, real or perceived, won't go away. A trip to the scene of the complaint is often helpful. You must notify the Department of Agriculture within 48 hours of receiving the complaint.

An applicator, whose actions or procedures allows any pesticide to be deposited on the person, lands, or property of another is required to file a written report to the Department of Agriculture within forty-eight (48) hours of the incident. Specify the location of the incident, the name of the pesticide involved, the type of formulation, the method of application, the name and address of the person for whom the application was being made, and the name and address of the person(s) whose land, person, or property was unintentionally exposed. In addition, if the pesticide is classified as either Extremely Toxic or Highly Toxic to people or animals, the applicator or operator will immediately cease the application and notify the landowner whose land, person, or property was unintentionally exposed and the Department of Agriculture. Apply first-aid or personal decontamination if appropriate.[1]

---

[1] BASIC PESTICIDE TRAINING MANUAL; Montana Department of Agriculture; 1987; p.41.

PESTICIDE REGULATIONS AND GUIDELINES

A. DISPOSAL OF PESTICIDES AND THEIR CONTAINERS

Proper disposal of pesticide containers and surplus pesticides is an essential operation for most applicators and dealers. Improper disposal may create serious health hazards or cause environmental contamination. Your responsibility as an applicator continues until all excess pesticides and containers are disposed of correctly. Disposal includes, but is not limited to: burial, recycling, incineration, encapsulation, returning to manufacturer, and any other approved method.

From the standpoint of public health, there is no such thing as an "empty container." Containers always retain residual amounts of pesticide. In the case of highly toxic pesticides, remaining residues may present a hazard to humans, especially children, pets, and livestock.

Prior to disposal, all "empty" containers should be kept in a separate locked building, room, or enclosure.

1. Classification of Sanitary Landfills

The Montana Department of Health and Environmental Sciences has developed a system for classifying sanitary landfills for disposal of various types of waste materials. Some landfills are approved for disposal of pesticide wastes. These wastes include excess pesticides, containers, and contaminated commodities and soils. They do not accept liquids.

Classification is based on geological and soil characteristics, depth of ground water, lack of surface water or flooding, and the proximity to population centers. Sanitary landfills are classified as either Class I, II, or III sites. Class I sites will allow for burial of the most toxic substances. Class II and III sites will allow for burial of moderately toxic to low toxic materials.

2. Disposal of Pesticide Containers

The Montana Solid Waste Management Act (MSWMA), as it pertains to the disposal of hazardous wastes, is enforced by the Department of Health and Environmental Sciences.

Follow these guidelines to help reduce the hazards of disposing of surplus pesticides and empty containers:

a. "Empty" containers are never completely empty.

b. Keep all empty containers in a locked storage area prior to disposal.

c. Never puncture or burn aerosol containers.

d. Do not reuse pesticide containers.

e. Triple rinse and break all glass containers and bury them in a state licensed sanitary landfill.

f. Use the Triple Rinse Method on all metal containers.

Step I. Empty containers in the normal manner and drain an additional 30 seconds.

Step II. Add the correct amount of rinse solution (usually water).

Container Size	Solution Required
1 gallon container	add 1 quart rinse solution
5 gallon container	add 1 gallon rinse solution

30 gallon container add 5 gallons rinse solution
50 gallon container add 5 gallons rinse solution

Step III. Replace closure, lid, or bung.

Step IV. Rotate and turn the container upside down for complete rinsing.

Step V. Drain rinse solution into your spray tank.

Step VI. Second Rinse - repeat Steps II through V.

Step VIII. Third Rinse - repeat Steps II through V.

g. To obtain maximum drainage of the pesticide material into a tank, puncture the head of the metal container.

h. After rinsing has been completed, dispose of containers in a sanitary landfill or designated recycling center.

i. Burn only combustible containers made of paper, cardboard, or plastic under approved conditions. Contact the Air Quality Bureau of the Department of Health and Environmental Sciences. Do not burn containers which have held herbicides such as 2,4-D and its derivatives. Vapors produced from burning this herbicide may damage nearby plants.

j. Never stand in the smoke or fumes of burning containers or pesticides.

k. Properly dispose of all unlabeled containers and their contents.

1. Never burn herbicides or defoliants containing chlorates as they will explode when heated.

3. Disposal of Large Volumes of Pesticides

Applicators who need to dispose of larger volumes of improperly labeled, old, or unusable pesticides should contact the Department of Health and Environmental Sciences, Solid and Hazardous Waste Bureau (444-2821). The Department will give technical assistance and recommendations for proper disposal to prevent environmental and public health accidents and potential legal problems.

For additional information, refer to "A Guide to Pesticide Disposal for Commercial and Government Applicators in Montana."

B. PESTICIDE STORAGE

Pesticides should be stored in a dry, locked, well ventilated area where humans and livestock cannot come in contact with them.

Pesticides must always be stored in the original, labeled container with the label plainly visible. To avoid possible cross contamination, never store pesticides near human or animal food.

Stored containers should be periodically checked for corrosion, leaks, breaks, and tears. Faulty containers are a hazard and must be disposed of and replaced immediately. Always keep the lids and bungs tightened on containers.

Install an exhaust fan for ventilation in storage rooms to reduce concentrations of toxic fumes and to hold temperatures down. Do not permit anyone to eat in a room where pesticides are stored.

1. Guidelines for Storing Pesticides

a. Plainly label the warehouse or storage room with the words "Danger" or "Poison," along with the familiar "Skull and Crossbones."

b. Post a list of chemicals being stored.

c. Keep the storage room or building locked when not in use. Storage facilities should have limited access.

d. Locate storage facilities as far as possible from other buildings and populated areas or away from normal pedestrian traffic. Fence the area if necessary.

e. When large quantities of pesticides are to be stored, install a sprinkler system.

f. All combustible materials should be kept away from steam lines or other heating devices.

g. Glass containers of chemicals should not be placed in sunlight.

h. Inform the fire department during facility inspections of the nature, quantities, and hazards of these compounds. Your your local fire chief should inspect your facility at least once a year.

i. Keep these individuals informed as to any changes in quantities, hazards, or nature of the contents of the facility.

j. Make sure employees are familiar with the building's fire fighting equipment, alarms, and fire exits and the hazards of each pesticide product.

k. Fire fighting equipment should be checked periodically and be ready for use at all times.

2. Pesticide Fire and Explosion Hazards and Precautionary Guidelines

Read the label when storing any pesticide and store each chemical in accordance with directions to prevent fires and explosions.

Many users of pesticides are aware of the contamination and public health hazards when applying chemicals, but do not recognize hazards from chemical fires. Fire prevention in pesticide storage areas does not always receive the attention it should when planning for storage structures and sites.

Many pesticides containing oils will burn readily or the containers will explode when over-heated. Some solvents used as carriers are highly flammable and explosive. Fumes and smoke from chemical fires can be highly toxic to fire fighters and residents in the area. Herbicide "smoke" can also be poisonous to nearby plants.

If a fire occurs, protect nearby residents by evacuating those down-wind. After the fire is out, the contaminated area should be roped off and supervised continuously until cleanup is completed.

Inform local police, fire departments, and public health officials in writing of the location and layout of the storage area, type of materials stored, and hazards involved. Provide phone numbers of persons responsible for storage with the fire chief. Fire departments should have a map with locations of all pesticide storage facilities in their areas. Inform local physicians and hospitals of potential hazards and be sure they know how to treat poisonings caused by the pesticides.

Cleanup procedures after the fire should be handled by persons familiar with pesticides and their hazards. Notify Disaster and Emergency Services at 444-6911 so correct decontamination procedures will be followed. Check with pesticide manufacturers for additional advice and use of their expert decontamination team, if necessary.

The Manufacturing Chemist's Association has introduced a program to provide emergency information to fire and police crews responding to transportation accidents and fires involving hazardous chemicals. _The nationwide CHEMTREC emergency number is (800)424-9300_.

3. _Pesticide Storage Life_

You should also be concerned about the storage "life" of each pesticide formulation in the storage facility. Some labels provide information on storage standards for the particular pesticide product. If storage information is not available locally, contact the proper company representative for recommendations. The following information provides an example of potential storage problems:

Chlorinated hydrocarbons are very stable and can be stored for a number of years with little or no chemical change. Organophosphorus pesticides such as TEPP, Parathion, and others have a relatively short storage life. Certain atmospheric conditions can bring about the breakdown of these materials. Labels will warn of such limitations and specify steps for prevention of pesticide deterioration.

> Liquid concentrates stored at low temperatures for prolonged periods of time may crystallize, separate out, or break down. The resultant material may be more or less toxic than the original, or may not perform as originally intended.[2]

TOXICITY OF HERBICIDES

Any herbicide, in large enough doses, can pose a serious health hazard. However, at recommended rates, most herbicides are not hazardous to man and the environment. Herbicides, as with all pesticides, should be used only according to label directions. The information provided on the label is for the safety of the applicator as well as for anyone in the area and label directions, including use of safety equipment, should be carefully followed.

---

[2] BASIC PESTICIDE TRAINING MANUAL; Montana Department of Agriculture; 1987; p.28-33.

A. TOXICITY CLASSIFICATION

All pesticides are classified according to their toxicity to people. The following table indicates the relative toxicity of different herbicides to people.

Toxicity Categories for Labeling Pesticides

Category	Signal Word Label	LD_{50} for 150 lb. Human Oral LD_{50} (mg/kg)	LD_{50} for 150 lb. Human Dermal LD_{50} (mg/kg)	Oral LD_{50} in Common Measuring Units
I	Danger	0 - 50	0 - 200	Taste-teaspoon
II	Warning	50 - 500	200 - 2000	Tsp-tablespoon
III	Caution	500 - 5000	2000 - 20,000	1 oz. - pint
IV	None	Over 5,000	Over 20,000	Over pint

* LD_{50} is the amount of pesticide, measured in milligrams per kilogram of body weight, that will kill one-half of the exposed pcpulation.

B. LD_{50} VALUES

Toxicity is the capacity of a substance to produce injury. The toxic action of greatest concern is the lethal dosage (LD) or the amount that will kill.

The acute oral toxicity has limitations because it represents only the immediate toxicity of an internal dosage and not the chronic and cumulative effects or any skin absorption or irritation. Few herbicides are absorbed rapidly through the skin and most herbicides do not accumulate in the body to a toxic level. However, some do cause skin irritation. LD_{50} values are expressed in terms of milligrams of chemical per kilogram of body weight (mg/kg). Some conversion factors to convert to common terms are:

1 ounce = 28.38 grams = 28,380 milligrams
1 kilogram = 1,000 grams = 2.2 pounds

Therefore, an LD_{50} of 1,000 mg/kg would be 3 ounces of material per 180 pounds of body weight.

A common standard for comparison might be aspirin, which has an LD_{50} value of 1,200 mg/kg. It would take 3.6 oz. of pure aspirin to kill an average 180 pound person.[3]

---

[3] WEED TRAINING MANUAL; Montana Department of Agriculture; 1986; p.30-32.

FIRST AID FOR INJURIES CAUSED BY "HAZARDOUS SUBSTANCES" AND "HARMFUL PHYSICAL AGENTS"

I. Poisoning

The symptoms produced by swallowing poisons vary according to the type of poison, the length of time since ingestion, and the size of the person in relation to the amount ingested.

The objectives in first aid for poisoning by mouth are to dilute the poison as quickly as possible, to contact a poison control center or a physician for remedial advice, to maintain respiration and circulation and treat for shock.

Begin to administer first aid immediately. If a second person is available, they should get the necessary advice from a poison control center, a physician or hospital emergency room, and call for an ambulance. If assistance is not available, give vital first aid immediately. Transport the victim to a medical facility as soon as possible. The caller should give the following information to get proper medical advice:

- Age of the victim.
- Name of the poison and amount swallowed if that is known, otherwise, the general nature of the poison.
- First aid being given.
- Information as to whether the victim has vomited.
- Your location and the time it will take to get to the doctor or the hospital and whether a police escort will be necessary.

Save the label or container of the poison for identification. Additional information may be gained from the victim.

The first aid procedures for a conscious victim:

- Dilute the poison by having the victim drink a glass of water or milk if the victim is conscious and not having convulsions. If it makes the victim nauseated, stop giving liquids.

- If the medical contact advises you to, induce vomiting.

- If the victim becomes unconscious, keep his airway open. Give artificial respiration or cardiopulmonary resuscitation (CPR) if indicated.

The first aid procedures for an unconscious victim:

- Maintain an open airway.

- Call for emergency help as soon as possible.

- Administer artificial respiration and CPR if indicated.

- Save the container of a suspected poison.

- If the patient has vomited, save a sample of vomited material.

- Do not give fluids to an unconscious person.

- Do not induce vomiting in an unconscious person.

If the victim is vomiting, turn the head and position it so that the material drains out of the mouth.

The first aid procedures for a poisoning victim who is having convulsions:

- Call for emergency help as soon as possible.

- Do not attempt to restrain the victim.

- Protect them from knocking against furniture or other objects.

- Loosen tight clothing at the victim's neck and waist.

- Watch for an obstruction of the airway and attempt to correct it by repositioning the victim's head if necessary. Give artificial respiration and CPR if needed.

- Do not force a hard object or a finger between the victim's teeth.

- Do not give any fluids.

- Do not induce vomiting. If the victim is vomiting, position him so that material drains from his mouth.

- After the convulsion, turn the victim on his side or place him in a prone position with the head turned to allow fluids to drain from the mouth.

II. Chemical Burns (General)

General first aid care for chemical burns:

A. Remove all clothing containing the chemical agent.

B. Do not use any neutralizing solution, unless recommended by a physician.

C. Flush with water for at least 5 minutes. For lye, flush for one hour.

D. Treat for shock by keeping the victim quiet and warm.

E. Transport to a medical facility or summon help after flushing is started. Do not wait until flushing is complete.

III. Chemical Burns to the Eyes

A. Acid Burns

First aid for acid burns of the eye should begin as quickly as possible with washing of the face, eyelids, and eye thoroughly with water for at least 15 minutes. Make sure the chemical does not wash into the other eye. If the victim is lying down, turn his head to the side and pour the water from the inner corner of his eye outward, holding his eyelids open. If you can quickly make a weak soda solution (1 teaspoonful of baking soda added to 1 quart of water), do so and use it, but begin by washing the eye with tap water.

- Call a physical as quickly as possible and ask for advice.

- Cover the eye with a dry, clean, protective dressing. Do not use absorbent cotton, because fibers may enter the eye. Caution the victim against rubbing his eye, because rubbing might cause further injury.

- If possible, bandage both eyes to prevent movement of the injured eye.

- Take the victim to an eye specialist; if this is not possible or if one is not available, get other medical assistance.

B. Irritating Gases

First aid for eye injuries caused by gases consists of irrigation of the eyes with large quantities of water.

IV. Heat

A. Heat Cramps

Heat cramps are often an early sign of approaching heat exhaustion, if there is a deficiency in both water and salt. The muscles of the victim's legs and abdomen are likely to be affected first. First aid measures include:

- Give the victim sips of salt water (1 teaspoonful of salt per glass), half a glass every 15 minutes, over a period of about 1 hour.

- Exert pressure with your hands on the cramped muscles, or gently massage them, to help relieve spasm.

B. Heat Exhaustion

In heat exhaustion, the body temperature is normal, or nearly normal. There is excessive pooling of blood in the capillaries of the skin, in the body's effort to lose heat. This pooling interferes with the circulation to vital organs, such as the brain, heart, and lungs.

As the body tries to compensate for the reduced supply of blood to critical areas, the smaller veins constrict, and the skin becomes white or pale and cool and clammy. The victim may faint but will probably regain consciousness if the head is lowered and the blood supply to his brain is improved. The victim may complain of weakness, nausea and dizziness, and perhaps cramps. First aid measures include:

- Give the victim sips of salt water (1 teaspoon of salt per glass), half a glass every 15 minutes, over a period of about 1 hour.

- Have the victim lie down; raise their feet from 8 to 12 inches.

- Loosen clothing.

- Apply cool, wet cloths and fan the victim, or move them to an air conditioned room.

- If the victim vomits, do not give any more fluids. As soon as possible, take them to a hospital.

- After an attack of heat exhaustion, the victim should be advised not to return to work for several days and should be protected from exposure to abnormally warm temperature.